

REMARKS

In the Office Action, the Examiner rejected claims 1-6 pursuant to 35 U.S.C. §102(b) as anticipated by Wright et al. (U.S. Patent No. 6,029,116). Claims 7, 9, 11-15, and 22-25 were rejected pursuant to 35 U.S.C. § 103(a) as unpatentable over Wright et al. Claims 8, 10 and 16-21 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Wright, et al. in view of Briemesser, et al. (U.S. Patent No. 5,622,177). Applicants respectfully request reconsideration of the rejections of claims 1-7 and 9-25, including independent claims 1, 9, 16 and 22.

Independent claim 1 recites processing signals and converting the processed signals within a transducer assembly. Wright et al. do not disclose these limitations. The circuits of Wright, et al. are part of the ultrasound system (Col. 7, lines 28-25). A transducer connector T-110 connects the circuits to the transducer arrays T-112 (col. 8, lines 5-11). The transducer arrays are interchangeable (col. 8, lines 16-22). Figure 2a shows only transducer elements T-114 in the transducer array T-112. Wright, et al. use interchangeable transducers that connect at a connector to the circuits of the imaging system, so do not suggest processing and converting within a transducer assembly.

Independent claim 9 recites a transducer assembly with a connector housing where the connector housing includes a detachable connector and a signal processing device. As noted above for claim 1, Wright, et al. disclose a connector on the imaging system and interchangeable transducers. The circuitry is all on the imaging system side of the connector T-110. Wright, et al. do not suggest a signal processing device in the connector housing of the transducer assembly.

Independent claim 22 recites processing in a transducer housing. As discussed above, Wright, et al. do not suggest this limitation. Claim 22 also recites further processing within a

detachable connector. Wright, et al. process in the imaging system on the other side of the connector T-110, not within a detachable connector.

Dependent claims 2-7, 10-15, and 24-25 depend from one of the independent claims discussed above, so are allowable for the same reasons. Further limitations distinguish from Wright, et al.

Claim 4 recites partially beamforming demultiplexed signals. Wright, et al. use a multiplexer to connect the beamformer to different element channels, but do not partially beamform demultiplexed signals. T-106 is used for transmit. Claims 14 and 25 are allowable for similar reasons.

Claim 6 recites mixing signals from a plurality of elements. Apodization is weighting individual signals with a multiplier, not mixing signals from a plurality of elements. Claim 12 is allowable for similar reasons.

Claim 7 is allowable for the same reasons as claim 22.

Claim 10 is allowable since a person of ordinary skill in the art would not have used the channel reduction of Breimesser, et al. with the beamformer of Wright, et al. Breimesser, et al. teach the line reduction being useful for 2D arrays instead of 1D arrays (col. 1, lines 40-47). However, Wright, et al. use 1D arrays (col. 8, lines 16-20). Wright, et al. also desire interchangeable arrays (col. 8, lines 16-31), so provide the circuits in the imaging system (col. 4, line 56; col. 6, lines 35-39; and col. 7, lines 27-35). Breimesser, et al. position circuits the transducer in a 3D imaging system. A person of ordinary skill would not have used electronics in the transducer of Breimesser, et al. since it would have resulted in expensive and needed circuits in the transducer, reducing interchangability.

Claim 1 is allowable for similar reasons as claim 10.

Independent claim 16 is allowable for the same reasons as claim 10 – a person of ordinary skill in the art would not have used the teachings of Breimesser, et al. with Wright, et al.

Independent claim 16 recites converting partially beamformed signals to a different form for the ultrasound system, the conversion being performed in the transducer assembly.

Wright, et al. provide all the circuits in the ultrasound system. Breimesser, et al. provide for multiplexing signals from elements in the transducer probe, but with demultiplexing in the ultrasound system (col. 4, lines 60 – col. 5, line 25). Breimesser, et al. do not convert beamformed signals.

Dependent claims 17-21 depend from claim 16, so are allowable for the same reasons. Further limitations distinguish from the cited references.

Figure 17 recites sub-array mixing. Neither reference suggests this limitation. Wright, et al. mix signals for down conversion, but do not sub-array mix.

Claim 18 recites demultiplexing in a connector housing. Breimesser, et al. demultiplex in the ultrasound system. Claim 18 recites demultiplexing partially beamformed signals. Breimesser, et al. demultiplex individual element signals.

Claim 19 recites converting and outputting in a connector housing, so is allowable for the same reasons as claim 9.

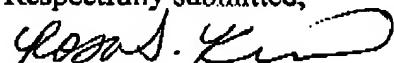
CONCLUSION:

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call the undersigned at (650) 943-7554 or Craig Summerfield at (312) 321-4726.

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